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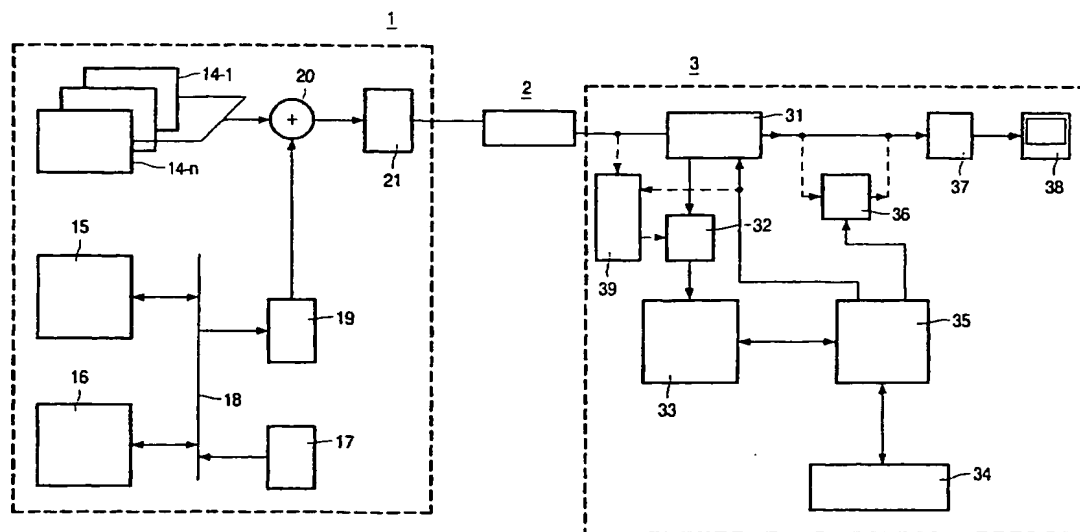
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(54) Title: TELEVISION SYSTEM FOR SUGGESTING PROGRAMS BASED ON CONTENT AND VIEWER PROFILE



(57) Abstract: A television system comprises a plurality of television programme sources (14-i to 14-n) and an associated data base (15) which contains data concerning the programmes for an Electronic Programme Guide (EPG) which is to be transmitted to a receiving device (3). Additionally a critics data base (16) which contains ratings by individual critics forming a panel of critics which review a given type of programme, for example sport, music, drama, current affairs etc. is provided and the ratings of individual critics are transmitted together with the EPG data. The ratings of individual critics are kept separate and are used in the receiving device for predicting which programmes are likely to be of interest to the viewer.

## TELEVISION SYSTEM FOR SUGGESTING PROGRAMS BASED ON CONTENT AND VIEWER PROFILE

### TELEVISION

5           The invention relates to a television system and to television transmission apparatus and to television receiving apparatus for use in such a system.

10           The task faced by a viewer in finding and selecting a television programme of interest for viewing is becoming increasingly difficult as the number of television channels increase. With analogue terrestrial broadcasts in the UK it has been feasible for a viewer to look for programmes of interest in lists printed in daily papers or weekly magazines since there are only five channels available to most viewers. Even with the addition of analogue  
15   satellite channels the task, although more difficult because tens of channels are available, is still possible. With the advent of digital transmission, however, the number of channels available rises to in excess of a hundred and the task of finding a programme of interest (or the most interesting programme) becomes too time consuming.

20           In order to ease the viewer's task a concept referred to as Humanised TV which needs only the normal one-way channel from the network to the receiver has been proposed.

          In simple terms, humanised TV may be considered to be an enhanced form of Electronic Programme Guide (EPG). A high performance EPG system  
25   is very good at finding specific things, for example 'all films on tonight' or 'when is the next news in my language'. However some effort is required on the part of the viewer to programme the system according to his or her specific requirements.

          This kind of effort may be acceptable for intensive use of a PC in a  
30   'work' environment, but TV is largely an entertainment medium for the home, and a more 'passive' approach in the user interface would be advantageous.

A variety of systems exist already to help users find TV programmes for viewing or recording. In all these systems the network provides some data about programmes which is decoded at the receiver. The viewer can interact with the receiver in some way via a user interface to perform some selection  
5 function for particular programmes or types of programmes.

In selecting TV programme material, both 'real-time' or 'direct' and 'pre-selection' or 'indirect' content data can be used. These two methods are complementary. For example, in the PDC (Programme Delivery Control) system as disclosed in EP-A-0300562 for programming video cassette  
10 recorders (VCRs), the item to be recorded is selected from a list using a cursor (indirect), and when the programme is broadcast, a real time switching signal ensures accurate timing of the recording (direct).

Other examples of direct content data are the various parental control systems such as 'V-chip' which categorise the currently broadcast programme  
15 in terms of age rating, violent content, etc, allowing fast reaction to programme content even though the channel may have been selected at random (zapping) just to see what was on.

Examples of indirect content data include EPGs where the main objective is to find out about TV programmes in advance, and make choices  
20 about what to watch. There are usually connections with direct data for accurate timing, pay-per-view billing, etc.

Another example of indirect content data is programme schedule data obtained from the Internet. Of course this needs a modem connection at the receiver, adding cost in many cases. Other aspects include the potential  
25 volatility of the web sites containing the content data, with the development of Internet technology and possible format changes, acquisitions, mergers and demises of the companies collecting the information. Users of TV equipment expect it to work for 10 years or more, and the Internet approach may be too risky for them. Also it may not be easy to ensure that the data covers all the  
30 programmes receivable with particular equipment in a given geographical location. For those reasons, an enhanced EPG approach is advantageous for humanised TV as it does not require a return channel.

A conventional EPG system uses a database containing information about all the programmes available on a channel or group of channels. This database may be created by the broadcaster or network provider or by a third party. The database contains factual information such as time of broadcast,  
5 network, title, genre, description, etc. Information from the database is conveyed to the receiver in some way, either through an independent broadcast channel or added to the TV transmission itself in a similar way to teletext transmissions.

At the receiver, an EPG decoder receives and decodes the content  
10 information and assembles a local version of the programme database. In a full performance EPG receiver, the entire database may be recreated: in more basic receivers, only a small subset of the transmitted information may be available, such as 'what's on now and next'. The viewer interacts with the EPG decoder via a user interface which causes the local database to be  
15 searched for the particular items (or category of items) required. Thus a conventional EPG system has one user (the viewer) interacting with factual information about the programmes available. The more programmes transmitted, the more specific the user's requests must be to narrow down the items required. Explicit selection of material, from a list of possible choices by  
20 network, genre, time, etc, is the only method available.

While users in general may find such methods manageable and maybe even fun to use, many people would prefer to find their desired programmes with less effort. One consequence is that viewers adopt a policy of 'brand loyalty' to a particular broadcaster or network, with the majority of channels  
25 available being simply ignored. Another consequence may be the continuance of 'zapping', just browsing the channels at random to look for something of interest.

Enhanced user interfaces, may be used to make user selection easier or more entertaining. Still or moving pictures containing representative frames  
30 from the relevant programmes may aid recognition. Speech recognition is another possible method of improving the user interface. While these technologies may increase the attractiveness of the product considerably, in

themselves they may not be sufficient to satisfy the casual viewer who just wants to find his or her favourite programmes or those likely to appeal from the thousands available, with little effort.

In order to improve performance compared to a conventional EPG system, several new elements may be included in a humanised TV system. In addition to explicit selection, it is possible to gain information about users' preferences by observing their behaviour over time. The actual programmes being watched can be monitored implicitly, giving clues not only to the type of programmes preferred but also other habits such as the times of TV viewing during the day or week. It is also possible to assess the degree of interest in a programme by monitoring how long it was viewed, e.g. right to the end, or just randomly selected for a few minutes. This is useful information which is obtained automatically without any extra effort on the part of the viewer. There are methods of obtaining this data (e.g. from teletext) even in the absence of EPG transmissions. An example of the gathering of such statistics is disclosed in US-A-5 757,414 which proposes a television system in which at least programme title information for programmes to be transmitted in the future is transmitted in advance to form a channel guide listing, apparatus is provided for searching for specific television programmes which satisfy certain criteria concerning a viewer's viewing preferences and, upon successful conclusion to the search, the apparatus generates a list of such programmes in order to indicate to the viewer certain programmes which might be of interest to the viewer. The apparatus may store information about which particular television programmes the viewer watches as a search criterion. The search criteria may also be editable by the viewer in order to further refine the searches.

A problem with all these prior art proposals is that there is a tendency to concentrate the users viewing on a restricted range of programmes making it difficult for a viewer to discover new interests, that is the set will present an increasingly concentrated list of programmes which are in the mainstream of the viewers interests and resist suggesting material which may presently be on the periphery of the viewer's interests or even outside the present interests but which might be appreciated by the viewer.

It is an object of the invention to enable the provision of a method of presenting programme information to a viewer which contains both material which has been explicitly gleaned from either the viewer's viewing habits or  
5 direct inputs by the viewer and material which may be inferred as being of possible interest to the viewer but outside the normal viewing habits.

The invention provides a television system comprising television transmission apparatus, a television transmission medium, and one or more television receiving devices, wherein the television transmission apparatus  
10 includes means for transmitting video, audio, and data signals, said data signals comprising data representing television programme information concerning programmes which are to be transmitted, and said television receiving device(s) comprising a data decoder for decoding said transmitted data, a memory for storing at least some of the data received by said receiving  
15 device(s), and a processor arranged to examine the stored data to determine programmes which may be of interest to a viewer based on information entered by the viewer and/or information derived from monitoring the viewing habits of the viewer, wherein the data signals include data representing individual ratings provided by a plurality of critics of television programmes to  
20 be transmitted and the processor is arranged to select or suggest programmes for viewing by taking into account the ratings of one or more of the critics.

By making the rating of a programme by one or more of a panel of critics, that is a group of critics assembled to give their opinions on a particular range or ranges of programmes, one of the factors on which the programme  
25 selection and/or suggestion is made those programmes which are highly rated by one or more of the critics making up the panel may be suggested to the viewer even if they do not satisfy other selection criteria. By having a panel of critics the opinion of one critic, with whom the viewer may or may not be sympathetic, will not become dominant. By encoding and transmitting the  
30 ratings of the critics individually, however, the processor can be arranged to give a greater weight to the rating of a particular critic if the viewer's opinion tends to coincide with that of a particular critic, although the opinions of the

other critics can still be taken into account, perhaps with different individual weightings. Clearly the panels of critics are not necessarily exclusive, that is a particular critic may serve on more than one panel, for example for a panel on music and one on drama.

5       The invention further provides television transmission apparatus comprising means for entering individual ratings from a plurality of critics into a database for at least some of the programmes to be transmitted by that or other television transmission apparatus and receivable by one or more receiving device(s), means for encoding the ratings for transmission with other  
10       data associated with the programmes, and means for transmitting the data.

      The television transmission apparatus includes means for entering individual ratings of programmes from a panel of critics. The ratings of each of the critics are kept separate and transmitted separately from those of the other critics on the panel. This enables each of the opinions to be considered  
15       separately within receivers of the data transmitted.

      The data may be multiplexed with one or more of the television programmes being transmitted by the transmission apparatus.

      This enables the data to be gathered at the receiver while the user is viewing and/or recording programmes. This is essentially the same as current  
20       teletext and EPG transmissions with analogue television transmissions where the data is transmitted during the vertical blanking interval and in this way conventional television data encoders and data inserters can be used in the transmission apparatus and conventional data decoders can be used in the receiving devices. With digital television transmissions it is also possible to  
25       multiplex the data with the data streams representing the video and audio signals for a given programme.

      Alternatively the data may be transmitted on a separate channel dedicated to data transmission.

      If this separate channel is an analogue television channel dedicated to  
30       data a larger amount of data may be transmitted more rapidly since the whole television field is available for data transmission and not merely the vertical blanking interval. Thus, depending on the memory capacity in the receiving

device, data relating to a greater number of channels can be transmitted or a more in depth description of forthcoming programmes can be transmitted. In addition programme schedules looking further into the future can be transmitted without the transmission cycle becoming unduly extended. In this case it is of course necessary to arrange that the data is captured either when programmes are not being viewed or recorded or to provide a separate selection circuit which is capable of receiving the data at the same time as a programme is being viewed on another channel.

The separate channel dedicated to data transmission may take various other forms such as an analogue channel dedicated to data but not of TV format and having either a higher or lower bandwidth than a standard TV channel. If such a channel has a lower bandwidth then the transmission cycle for a given quantity of data will, of course, be increased. A further possibility with the transmission of television programmes and associated data digitally is to allocate a multiplex to the data and this will normally allow an increased amount of data to be transmitted or provide a shorter transmission cycle. In addition an entirely different transmission medium may be used for the data transmission, for example the internet or a satellite channel.

From the above it will be apparent that it is not essential that the dedicated data channel has a high bandwidth, particularly if the receiving device has a large memory capacity and can be left in a standby condition, when not being viewed, such that the data in the data channel can be captured and stored for use when the viewer wishes to access the database or select (or have selected) a programme for viewing.

The invention further provides a television receiving device for receiving television programmes and data signals transmitted by television transmitting apparatus, said receiving device comprising a data decoder for decoding said transmitted data, a memory for storing at least some of the data decoded by said data decoder, and a processor arranged to select and/or suggest programmes for a viewer to receive, said selection and/or suggestion being based on information entered by a user and/or derived from monitoring the viewing habits of the user, in which the data signals include data representing



the individual ratings of a particular program by a plurality of critics and that said selection is further based on the rating accorded by one or more of the critics.

In the television receiving device according to the invention a memory  
5 stores data relating to programmes which will be transmitted at a later time and this data includes the rating of the programmes by a panel of critics. The ratings of individual critics are stored separately (associated with the relevant programme) so that the processor in the receiving device has access to each critics individual rating for each programme. The processor uses the data  
10 received and stored together with a user profile, which includes data defining the users interests and habits as far as viewing or recording programmes is concerned, in order to determine which of these programmes which are to be transmitted are likely to be of interest to the user. The presentation to the user may be made in a number of different ways. For example, a list of  
15 programmes which are likely to be of interest may be generated and displayed when the receiving device is switched on. Alternatively, the list may be displayed when the user calls it up using a remote control device. Another possibility is to cause a message to be displayed when a programme of possible interest is about to start or to switch the receiver from a stand by state  
20 to a fully on state when an interesting programme is about to start.

A remote control device may be provided to enable the user to select programmes and other functions of the receiver, the remote control device being arranged to transmit an identification signal to the receiving device specific to the user and the receiving device includes means for receiving the  
25 identifying signal and thereby determining the identity of the user.

By this means the processor can verify that the user is the person whose user profile is contained within the receiving device.

The remote control device may include means for transmitting one of a plurality of identification signals, the particular identification signal transmitted  
30 depending on the person currently using the remote control device.

If the receiving device is able to store a different user profile for a number of different users, for example different members of a family residing

at the same address and using a common receiving device, then it can use the user profile of the person currently using the receiving device. Clearly the viewing profiles of different members of a family may be significantly different when the family includes both male and female members and different generations such as parent and child. There are many possibilities for enabling the remote control device to emit a different identification signal for different users. One possibility is to provide it with a number of user identity keys which are labeled according to the user and which cause different identification signals to be generated. One of these keys is operated by the user to announce his or her identity and then the other functional keys can be used. The receiving device then uses that user's profile until another user identification key is operated. Another possibility is the use of an automatic recognition means for example a fingerprint sensor, on the remote control device. The fingerprint sensor would identify the user and cause the appropriate identification signal to be transmitted. It will be understood that these are only two examples of many possibilities for identifying to the television receiving device the identity of the user.

As an alternative a plurality of remote control devices may be provided, each of which is arranged to transmit a different identification signal and each of which is identifiable to the users to enable each user to use a particular one of the remote control devices.

This enables each of the remote control devices to be of a simpler form since only a single identification signal needs to be generated in each remote control unit. It will be apparent that only a small number of different identification signals are required, typically less than eight since there will be a limited number of users of a television receiving device in a single household and the identification signals can be re-used in other households. The identification signal may merely be a number which is allocated to each remote control device. The identification of the respective remote control devices for the users may take any convenient form, for example different colours or

labels on the devices or by making the remote control devices of different shapes such as characters from cartoons or imitations of other objects.

The television receiving device may be arranged to receive data signals transmitted on a different channel from television programmes and comprise  
5 first channel selection means for selecting a programme channel and second channel selection means for selecting a data channel.

In an analogue television context full channel transmission of data allows a greater quantity of data to be sent while keeping the cycle time within reasonable limits since the data can occupy the full field and not just the  
10 vertical blanking interval. It will be appreciated that the data is sent serially and once all the data has been sent then the cycle of transmission is repeated. Clearly the length of this cycle is dependent on the quantity of data to be transmitted and the rate at which the data is transmitted. While the transmitted data can be stored indefinitely in the receiving device it is necessary that a full  
15 cycle is completed while the receiving device is switched on in order to enable all the data to be stored unless the receiving device has a standby mode in which data is captured and stored when the rest of the receiver is switched off. Also the data will be updated on occasions and it is desirable that the updated data is transmitted without substantial delay. By providing two selection  
20 means the receiving device can keep the data stored up to date by monitoring the data channel while the user is watching one of the programmes and hence it is not necessary to periodically tune to the data channel and thus interrupt viewing of the programmes.

Thus the term television receiving device does not only include a  
25 standard television receiver but also includes any device which is capable of receiving television signals, for example a set top box or a video recorder, even if it does not include a display device and/or audio reproduction means. As another example the television receiving device might be a personal computer having a TV card, in which case the data channel might be the  
30 internet which enables a large quantity of data relating to the available television programmes to be downloaded into memory and highly complex operations to be performed on that data with the large processing power

contained in personal computers. Similarly, it has been proposed to connect set top boxes to the internet and to include such facilities in otherwise conventional television receivers,

5 If the television receiving device is a video recorder then it can record for later viewing the programmes which are of interest to the viewer and are transmitted when the viewer is not watching the television set or is watching another programme.

The invention still further provides a method of selecting television programmes for viewing and/or recording comprising the steps of;

- 10 i) receiving data representing programmes to be transmitted, said data indicating at least the date, and time of transmission of the programme and the programme type,
- ii) receiving data representing a rating given to programmes by individual members of a panel of critics,
- 15 iii) storing at least some of the data,
- iv) entering and/or generating and storing a user profile indicating the type of programmes the user prefers to view, and
- v) selecting a programme for viewing and/or recording using the stored data and the user profile.

20 Using such a method enables a television receiving device to select programmes which may be of interest to a user. By including ratings of programmes from a panel of critics and keeping the individual ratings of each of the critics separate it is possible to give a greater weighting in the selection criteria to the rating of a critic with whom the user has the greatest sympathy.

25 Since the viewing of individual critics is likely to be different from and may be more extensive than that of individual users this gives the possibility of suggesting programmes which the user may not have noticed, as being outside the normal area of interest.

The selection step may comprise providing a suggestion to the user as  
30 to which current or future programmes are likely to be of interest.

Thus the receiving device may be arranged to provide a list for suggested viewing for the day or evening when the receiving device is

switched on or when requested to do so by the user entering requests using the remote control device. This may simply be the programme or programmes of most interest which are about to start or which will start in the near future, for example within the next fifteen minutes. Alternatively it could be a list of programmes for a whole evening's viewing or, particularly for a video recorder, for a longer period such as two weeks while the viewer will be on holiday. The receiving device may provide a list of programmes occurring simultaneously so that the viewer can choose to watch one and record another for later viewing. The user profile may be generated and/or refined by monitoring those programmes the user chooses to view or record and may for example give greater weight to programmes which are selected for recording as being more likely to be of a particular interest.

Over a period of time an accurate user profile can be build up by monitoring those programmes which are watched or recorded and this profile can be continuously refined as the viewer's tastes change or develop. This, however, does mean that on initial use the receiving device has no knowledge of the viewer's interests and hence suggestions for viewing will be non-existent or random. In order to overcome this problem it is possible for the viewer to enter some initial information as to his or her interests, for example using a menu and selection scheme by entering choices using a remote control device. This initial profile is then continuously updated by monitoring those programmes watched or recorded.

As an alternative the receiver may be pre-programmed with a user profile generated from typical viewing preferences. For example, most people watch news programmes and may watch soap operas and sports programmes. Starting from such a profile the actual choices of a viewer will refine the choice to more closely coincide with the interests of the viewer.

The method may further include the steps of storing user profiles for a plurality of users, identifying the current user, and using the profile of the identified user in the programme selection.

This enables programmes which are likely to be of interest to one of several users of a particular television receiving device such as a television set

in the living room of a home. In this situation the television set may be viewed by parents and children of both sexes who are likely to have widely different interests and consequently programmes which are of interest to one may have no interest for other members of the family.

5       The above and other features and advantages of the invention will be apparent from the following description, by way of example, of embodiments of the invention with reference to the accompanying drawings, in which:-

Figure 1 shows in block schematic form a television system according to the invention, and

10       Figure 2 shows a block schematic form television receiving apparatus according to the invention suitable for use in a system as shown in Figure 1.

Figure 1 shows in block schematic form a television system according to the invention which comprises television transmission apparatus 1, a television transmission medium 2, and television receiving apparatus 3. The television transmission apparatus comprises a plurality of programme sources 14-1 to 14-N. In addition there is a programme content data base 15 which stores data relating to the programmes generated by the programme sources. This data will include the date and time of transmission of the programmes and the type of programme for example, film, sport, music, drama, news etc. The content data base may also include background information on the programmes to be transmitted, such as biographical details of the author, producer, actors or a synopsis of the story so far if the programme is transmitted as part of a series. Television transmission apparatus including such data bases are already known and the database content is tailored to the particular service which is provided. That is a relatively small and simple data base for services such as teletext and a more complex and comprehensive data base for the more recently introduced electronic programme guides. In the television apparatus according to the invention there is also provided a critics data base 16. This data base contains data which represents the verdict of a panel of critics on at least some of the programmes to be transmitted. The individual judgements of the critics are kept separate and not

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combined. Thus there is also associated with each programme the ratings of each of the critics for that particular type of programme as well as the data in the content data base 15 which describes the factual data relating to the programme such as time of transmission, length of programme, and classification of programme, that is sport, film, music, news etc. There may be a panel of critics which gives opinions on drama, another panel which gives opinions on classical music, another panel which gives opinions on documentaries and so on. As a result for each programme there will be stored a code within the critics' data base which identifies the particular critic and a further code which gives the rating allocated to the programme by that particular critic. Data is read from the programme content data base 15 and the critics' data base 16, under the control of a processor 17 via a bus 18 to a data encoder 19. The data is selected by means of the processor 17, which receives input from the controller of the databases 15 and 16. In a typical implementation the programme content data and associated critics data will be broadcast in a cyclical pattern ahead of the programmes which are being transmitted so that a similar data base can be built up in the receiving apparatus. The data encoder 19 may take any convenient form which will encode the data into a format which is according to a particular standard which has been adopted in particular countries or by different service providers or for different transmission media. The standards may vary but the design of such encoders is within the competence of the person skilled in the art once the standard by which the data is to be encoded has been defined.

The output of the encoder 19 is fed to a first input of a combiner 20, a second input of which receives the television programme from one or more of the programme sources. The combined television programme and data is passed to a transmitter 21, which may take any convenient form and which produces the output of the television transmission apparatus. This output comprises television programmes plus data which includes data which specifies programmes which will be transmitted in the future from a number of the programme sources and also data which gives a rating by a plurality of critics of at least some of the programmes to be transmitted. In addition the

real time data such as PDC data is combined with the other data for encoding by the encoder 19. The output from the television transmission apparatus is transmitted via a transmission medium 2, to a plurality of television receiving apparatuses. The transmission apparatus and transmission link may take  
5 many forms, for example terrestrial broadcast television transmissions, cable television networks or satellite television systems and may be of any form for example analogue television with teletext or electronic programme guides transmitted according to world system teletext specifications, or digital television broadcasts encoded in any of the standards which are or become  
10 available.

Although in Figure 1 the data channel is fed via combiner 20 to the transmitter 21 it may be fed to a different transmitter and may be entirely separate from the programme sources. Further it may contain data relating to programmes which are transmitted from a different transmitter or over other  
15 transmission means, for example a cable network. Alternatively the data channel may be provided via a satellite link or over a data network such as an internet. Thus the data may be transmitted on a separate channel, or may be multiplexed with one or more programme channels and may refer to programmes from a different transmitter.

20 The television receiving apparatus 3 comprises a first channel selection means 31 which may comprise tuning and/or demultiplexing circuit which selects a particular channel being transmitted for reception and display on a display screen or for recording. Some or each of the programmes which are transmitted have a data signal associated with them and this data signal is fed  
25 from the tuning and/or demultiplexing circuit 31 to a data decoder 32. The data decoder 32 decodes the data and feeds the decoded data to the programme data base 33. This programme data base will store some or all of the data transmitted over the data channel associated with the programmes and decoded by means of the data decoder 32. A second channel selection  
30 means 39 (shown dotted) may be provided which is arranged to select a data channel which may be either a dedicated data channel or a data channel associated with a different programme channel from that selected by the first



channel selection means 31. The output of the second channel selection means is connected to the data decoder 32 instead of or in addition to the output of the first channel selection means 31. This enables data to be captured and stored when received on a different channel from that being viewed. A user interface 34 is provided to enable the viewer to interact with the television receiving apparatus. Thus for example the user interface will typically comprise a remote control unit which may have a number of keys which the user activates and which transmits a signal to a receiver part within the television receiving apparatus which is able to receive and decode the signals produced by the remote control unit. Typically these signals are sent via an infra red transmission link. Some of the keys will be used to select a particular channel for viewing or recording and there will also be keys which are used to select data from the programme data base for display. This selection is achieved using a processor circuit 35 which will typically comprise a microcontroller or microprocessor.

The processor 35 controls the tuning and/or demultiplexing circuit 31 to cause a particular channel to be selected. The selection of this channel may be either as a result of the user directly selecting the channel by means of the remote control unit or may arise from programme information which is stored in the programme data base and rules programmed into the processor defining how the data should be used for selecting the particular channels which are likely to be of interest to the viewer. The output of the tuning and/or demultiplexing circuit 31 is fed to the conventional audio/video circuits 37 which take the input programme signal and convert it for display on a display unit 38, which may be of any convenient form, for example the conventional cathode ray tube display device or a liquid crystal display.

Instead of selecting the programme for immediate display a programme may be selected for recording. The recording device may share the same tuning and/or demultiplexing circuit 31 or may have its own separate tuning and/or demultiplexing circuits and in that case an output from the processor 35 will be sent to the record/replay unit 36 to instruct it to record a particular programme at a particular time. The record/replay device 36 may be integral

with the receiving apparatus or may be a separate device such as a video cassette recorder.

Figure 2 shows an embodiment of the television receiving apparatus 3 in which the television receiving apparatus comprises a set-top box for receiving digital television programme signals. The input signal is applied to an input 201 which is connected to a channel selection circuit 202. This will demultiplex a required channel from a series of multiplexed channels. Data associated with the television programme is also contained within the multiplex either in association with the selected television programme or as a separate data channel which contains data relevant to all of the channels within the multiplex, or even within other multiplexes. This data is fed to a data decoder 203, which detects the data and decodes it to put it into a suitable format for storage in the programme data base 204. The data stored in the programme data base is either all the received data or a selected subset which is determined by means of a processor 205. The processor also receives an input from a receiver circuit 206 which receives input signals from a remote control unit 207 by means of which the user inputs the channel number of the desired programme and/or other information which is required to enable the user to view the programme that he or she wishes to see. The processor 205 will control the channel selector 202 to enable the desired channel to be decoded by means of a programme decoder 208. The processor 205 is also fed to a selector circuit 209 by means of which the viewer can either view a channel which has been selected or may view data which has been stored in the programme data base, for example teletext or electronic programme guide information. The processor 205 may also apply signals to the selector circuit to provide on screen displays for the set up of the receiver. The set top box has an output 211 which may for example comprise composite video or an RGB signal and audio signals which are fed to the audio video circuit of a display unit. Alternatively they may be fed to the input of a video recorder.

The processor also has a further memory 210 associated with it. The memory 210 is used in order to enable the processor to store the viewing habits and/or explicit preferences of the user. In one embodiment the

processor will monitor those channels which the viewer selects by means of the remote control unit 207. From the programme database 204 the processor can determine the programme which is being transmitted on the selected channel at any particular time. Thus if the user enters by means of the remote control unit 207 the channel number of a programme which is presently transmitting a sports programme, the processor can monitor this because the programme database will include the information that the selected channel is broadcasting a sports programme at that time. This information can be entered into the memory 210 and a picture built up of those types of programme the viewer habitually chooses. As this may vary according to the time of day (particularly if there are multiple viewers) the time of transmission of the programme can also be shared in the memory 210. Thus over a period of time the processor 'learns' what the tastes of the viewer are and is able to predict from the data in the programme database when and on which channel a particular programme which is likely to be of interest to the viewer is being or will be transmitted. Once the user profile has been built up the processor will be able to choose programmes which are likely to be of interest to the viewer, thus relieving the viewer of the task of scanning through all the programmes which are available.

In addition to monitoring the types of programme, that is sport, news, drama, music etc. that the viewer chooses to watch the programme processor also monitors whether the viewer chooses to watch programmes which are highly rated by a particular one of the critics making up a panel. If it is determined that the viewer tends to watch programmes that are highly rated by a particular one of the critics, the processor can be programmed to give a high weighting to those programmes which that particular critic rates highly. This ensures that programmes which are most likely to be of interest to the viewer are presented to the viewer at the time that they are transmitted. It also ensures that programmes which may not otherwise be known to the viewer but which are highly rated by the viewer's favourite critic(s) are presented to the viewer to enable selection if desired.

An alternative way of operating the receiving apparatus is for the processor to generate a list of programmes which are likely to be of interest to the viewer, for example an evenings viewing. When the receiving apparatus is switched on the processor can be arranged to present in a list form the programme schedule for the evening with the recommended programmes for the viewer to watch. These programmes will be selected by means of monitoring the viewers viewing habits and by giving particular weighting to certain of the critics ratings of the programmes where it has been learnt that the viewer tends to agree with that particular critic's rating. The list of programmes deemed suitable for viewing over a period, which may be defined by the viewer, may be generated at switch on and displayed immediately or may be called up to display by the viewer using the remote control unit.

It has been assumed in the foregoing that the preferences of the viewer are learnt over a period of time. There remains however a problem that if the viewer newly purchases the receiving apparatus it has no knowledge of the viewer's preferences. It is therefore advantageous if the viewer is given some facility for entering their own preferences as a starting point, that is on initial switch on, the receiving apparatus may ask the viewer by means of a menu presentation which particular topics the viewer is interested in. Thus for example it may ask the viewer to rate in order of preference say, news, drama, music, sport, documentaries etc. and within each category to also put their preferences, for example in music whether it is classical, popular, jazz, dance etc. Thus an initial user profile can be assembled from which the processing arrangement 205 may start to construct the user profile. This will be refined as time goes on as the processor is able to monitor those programmes which the viewer actually watches and selects.

A further advantageous embodiment of the invention, in a multi user household, is to allocate a different remote control unit to each user. The remote control unit will be arranged to transmit a code that is specific to the viewer so that the receiving apparatus knows which viewer is actually operating the receiving apparatus. If within the viewer preferences a plurality of profiles are stored, one for each of the users then the programmes which

are most likely to be of interest to that particular viewer can be selected. It is known for example that programme preferences vary widely, particularly between male and female and between adult and child. Thus a composite viewer profile may produce choices which are of little interest to one or more of the users in a multi user household.

From reading the present disclosure, other modifications and variations will be apparent to persons skilled in the art. Such modifications and variations may involve equivalent features and other features which are already known in the art and which may be used instead of or in addition to features already disclosed herein. Although claims have been formulated in this Application to particular combinations of features, it should be understood that the scope of the disclosure of the present application includes any and every novel feature or any novel combination of features disclosed herein either explicitly or implicitly and any generalisation thereof, whether or not it relates to the same invention as presently claimed in any Claim and whether or not it mitigates any or all of the same technical problems as does the present invention. The Applicants hereby give notice that new claims may be formulated to such features and/or combinations of such features during prosecution of the present application or of any further application derived therefrom.

## CLAIMS

1. A television system comprising television transmission apparatus, a television transmission medium, and one or more television receiving devices, wherein the television transmission apparatus includes means for transmitting video, audio, and data signals, said data signals comprising data representing television programme information concerning programmes which are to be transmitted, and said television receiving device(s) comprising a data decoder for decoding said transmitted data, a memory for storing at least some of the data received by said receiving device(s), and a processor arranged to examine the stored data to determine programmes which may be of interest to a viewer based on information entered by the viewer and/or information derived from monitoring the viewing habits of the viewer, wherein the data signals include data provided by a plurality of critics representing individual ratings of television programmes to be transmitted and the processor is arranged to select or suggest programmes for viewing by taking into account the ratings of one or more of the critics.

2. Television transmission apparatus comprising means for entering individual ratings from a plurality of critics into a database for at least some of the programmes to be transmitted by that or other television transmission apparatus and receivable by one or more receiving device(s), means for encoding the ratings for transmission with other data associated with the programmes, and means for transmitting the data.

3. Television transmission apparatus as claimed in Claim 2 in which the data is multiplexed with one or more of the television programmes being transmitted by the transmission apparatus.

4. Television transmission apparatus as claimed in Claim 2 in which the data is transmitted on a separate channel dedicated to data transmission.

5. A television receiving device for receiving television programmes and data signals transmitted by television transmitting apparatus, said receiving device comprising a data decoder for decoding said transmitted data, a memory for storing at least some of the data decoded by said data decoder, and a processor arranged to select and/or suggest programmes for a viewer to receive, said selection and/or suggestion being based on information entered by a user and/or derived from monitoring the viewing habits of the user, in which the data signals include data representing the individual ratings of a particular programme by a plurality of critics and that said selection is further based on the rating accorded by one or more of the critics.

6. A television receiving device as claimed in Claim 5 in which a separate user profile is stored for each user so that when a particular user is identified suitable programmes are selected and/or suggested.

7. A television receiving device as claimed in Claim 5 or Claim 6 in which a remote control device is provided to enable the user to select programmes and other functions of the receiver, wherein the remote control device is arranged to transmit an identification signal to the receiving device specific to the user and the receiving device includes means for receiving the identifying signal and determining the identity of the user.

8. A television receiving device as claimed in Claim 7 in which the remote control device includes means for transmitting one of a plurality of identification signals, the particular identification signal transmitted depending on the person currently using the remote control device.

9. A television receiving device as claimed in Claim 5 or Claim 6 in which a plurality of remote control devices are provided, each of which is arranged to transmit a different identification signal and each of which is identifiable to the users to enable each user to use a particular one of the remote control devices.

10. A television receiving device as claimed in any of Claims 5 to 9 for receiving data signals transmitted on a different channel from television programmes comprising first channel selection means for selecting a programme channel and second channel selection means for selecting a data channel.

11. A television receiving device as claimed in any of Claims 5 to 10 which comprises a set top box.

12. A television receiving device as claimed in any of Claims 5 to 10 which comprises a video recorder.

13. A method of selecting television programmes for viewing and/or recording comprising the steps of;

- i) receiving data representing programmes to be transmitted, said data indicating at least the date, and time of transmission of the programme and the programme type,
- ii) receiving data representing a rating given to programmes by individual ones of a panel of critics,
- iii) storing at least some of the data,
- iv) entering and/or generating and storing a user profile indicating the type of programmes the user prefers to view, and
- v) selecting a programme for viewing and/or recording using the stored data and the user profile.

14. A method as claimed in Claim 13 in which the selection step comprises providing a suggestion to the user as to which current or future programmes are likely to be of interest.



15. A method as claimed in Claim 13 or Claim 14 in which the user profile is generated and/or refined by monitoring those programmes the user chooses to view or record.

- 5           16. A method as claimed in any of Claims 13 to 15 comprising the steps of storing user profiles for a plurality of users, identifying the current user, and using the profile of the current user in step v).

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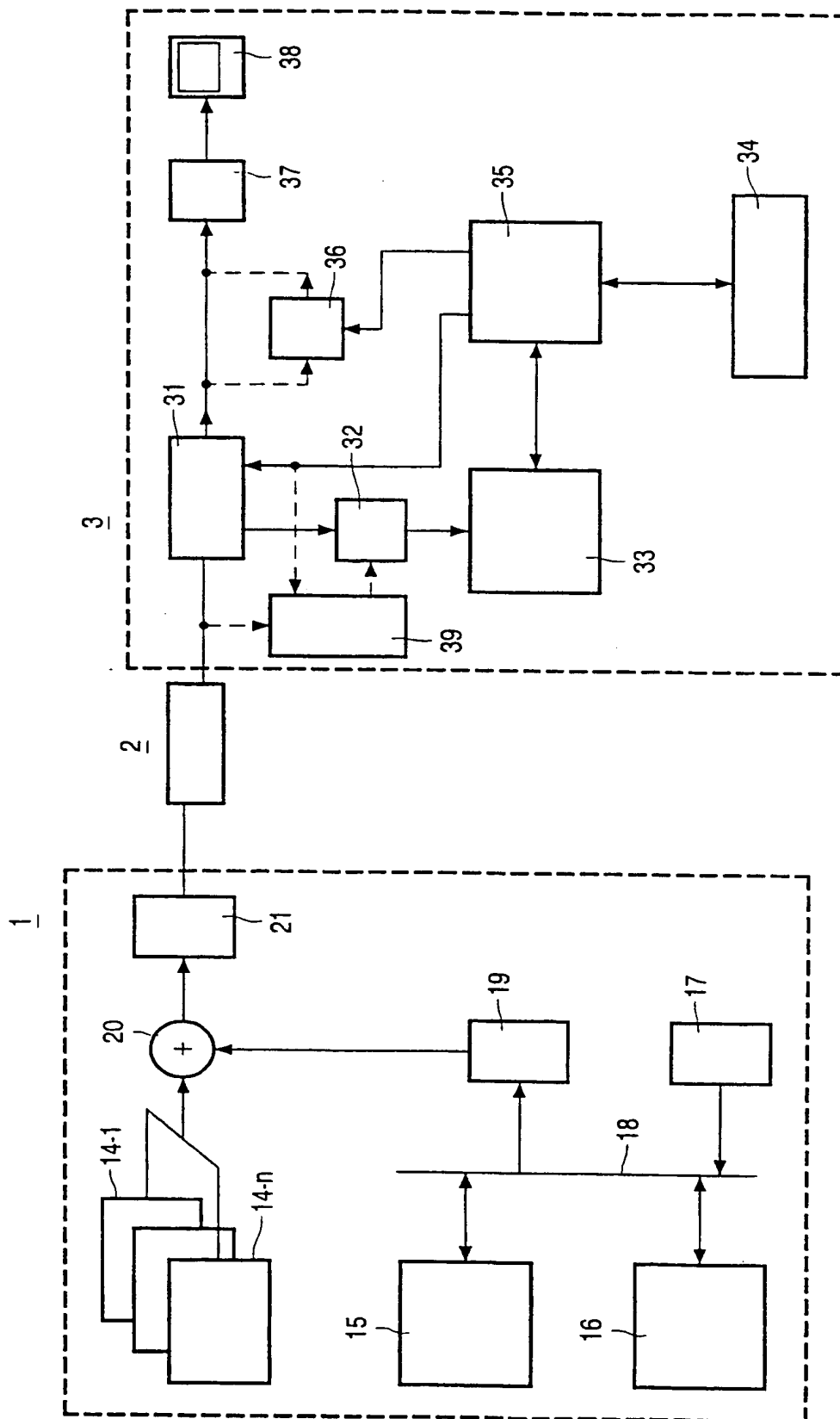


FIG. 1

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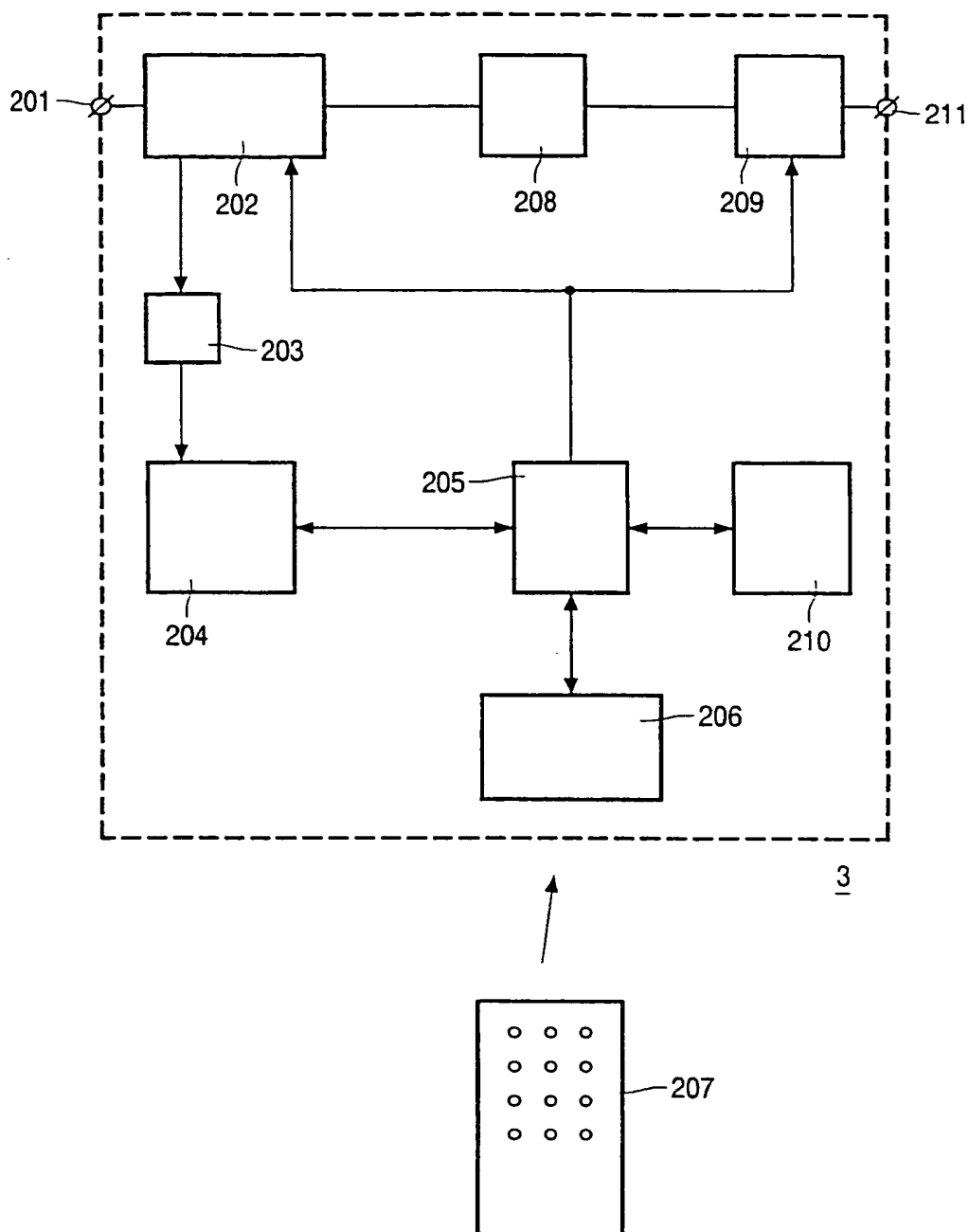


FIG. 2

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP 00/09221

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04N7/16

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 758 257 A (HERZ FREDERICK ET AL) 26 May 1998 (1998-05-26) column 24, line 56 - column 25, line 6 column 25, line 45 - line 48 column 26, line 30 - line 39 column 40, line 52 - line 60 column 45, line 56 - line 63	1-8,10, 11,13-16
Y	US 5 835 087 A (EISNER JASON M ET AL) 10 November 1998 (1998-11-10) column 10, line 7 - line 20	1-8,10, 11,13-16

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

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Date of the actual completion of the international search

30 November 2000

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13/12/2000

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/09221

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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